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Stratification of Centrifuged Amoeba Nuclei Investigated by Electron Microscopy

The stratification of centrifuged amoeba nuclei has been researched by Edward W. Daniels and Evelyn P. Breyer of the Biological and Medical Research Division of Argonne National Laboratory. The study has been conducted to establish a relationship between radioresistance and the nucleolar stratification characteristics of various amoeba species. A summary of their work, entitled "Stratification Within Centrifuged Amoeba Nuclei," has been published in *Zeitschrift für Zellforschung*, volume 70, pages 449-460, 1966.

In the study, two species of large, fresh water amoebae, *Amoeba proteus* and *Pelomyxa illinoisensis*, are ultracentrifuged and studied with the electron microscope. Emphasis is placed on the stratification of the nucleoplasm, including the nucleoli, within the nuclear envelope during interphase. After four hours of centrifugation at 140,000 g, the intranuclear components of both amoebae are clearly separated into three major strata: the centripetal nucleoplasm, the middle chromatin stratum, and the centrifugal nucleolar mass. The heaviest and most opaque of the three layers, the nucleolar mass, is located at the centrifugal pole. The report indicates that this opaque stratum is composed of nucleoli which have migrated centrifugally and have fused into a single mass.

In the highly radioresistant *A. proteus*, the nucleolar mass separates into a centripetal electron-opaque layer and a centrifugal electron-lucent layer. This latter layer, however, is missing from the radiosensitive *P. illinoisensis*. The report discusses the nature of these nucleolar layers and their possible relationship to the differences in radiosensitivity of the two amoeba species. It is suggested that the contents of the

heavier of the two nucleolar layers in *A. proteus* might be resistant to radiation damage and may possess a radiorestorative capacity.

Notes:

1. The report includes a discussion of experimental materials and methods, results, and a comprehensive bibliography.
2. This information may be of interest to researchers in growth and tissue differentiation, including cancer research.
3. Inquiries concerning this innovation may be directed to:

Office of Industrial Cooperation
Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439
Reference: B68-10366

Source: E. W. Daniels and E. P. Breyer
of the Biological and Medical
Research Division
(ARG-10161)

Patent status:

Inquiries about obtaining rights for commercial use of this innovation may be made to:

Mr. George H. Lee, Chief
Chicago Patent Group
U.S. Atomic Energy Commission
Chicago Operations Office
9800 South Cass Avenue
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